2014

TEACHER TRAINING IN OPPORTUNITIES TO RESPOND AND POSITIVE FEEDBACK: EFFECTS ON STUDENT ENGAGEMENT

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THESIS

A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science in
the College of Education
at the University of
Kentucky

By
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2014

ABSTRACT OF THESIS

TEACHER TRAINING IN OPPORTUNITIES TO RESPOND AND POSITIVE FEEDBACK: EFFECTS ON STUDENT ENGAGEMENT

This study investigated the impact of a brief teacher training combined with use of a MotivAider that sought to simultaneously manipulate rate of opportunity to respond and positive feedback on students' on-task behavior during a classroom activity. The goal of the training was to increase the percentage of time the learner stayed on task during the class activity. Three elementary teacher-student dyads took part in this study. An A-B-A-B withdrawal design was employed to evaluate the function of relation between independent and dependent variables. Results showed low effectiveness of brief training and MotivAider as a strategy of increasing teachers providing the opportunity to respond, positive performance feedback, and student on-task behavior. Although changes in teacher behavior were observed, a functional relation was not established. There were several limitations identified in this study related to data collection process, IOA results, and beginning baseline and intervention phases. Suggestions for future research are provided.

KEYWORDS: opportunity to respond, performance feedback, on-task behavior, behavior specific praise, MotivAider

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04.24.2014

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April 24, 2014

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Introduction

Current education practices have required higher levels of teacher performance and greater professional and individual responsibility for ensuring student learning. Teachers are expected to improve content delivery using evidence-based educational practices while developing positive relationships with students (Cavanaugh, 2013). Teachers are expected to implement evidence-based practices that lead to higher academic and behavior achievement of all students (Cavanaugh, 2013; Heckler, 2011; Niesyn, 2009; Spencer, Detrich, & Slocum, 2012).

Students with high levels of inappropriate behaviors present multiple challenges for classroom teachers related to academic and social functioning. Kaufmann and Landrum (2013) stated that the majority of teachers are less likely to involve students with challenging behaviors in classroom activities. This can be affected by teachers' personal attitudes and students' behavior. Another factor that causes teachers to struggle with challenging behaviors is a negative reinforcement trap (Gunter & Coutinho, 1997). This "trap" is the result of inappropriate student behavior being maintained because of reinforcement through the escape or avoidance of an aversive stimulus (e.g., academic demands; Gunter & Coutinho, 1997). Thus, student behavior is a crucial and essential factor that significantly influences both relationships between teachers and student as well as student's academic success. A reciprocal relationship might be found between student behavior and academic success (Cooper, Heron, & Howard, 2007). That is, improvement in academic achievement might result in increases in appropriate social

behaviors of a student.

In addition to appropriate behavior, there is at least one more component that significantly impacts students' academic achievements. De Haas-Warner (1991) described that component as ability to pay attention or to stay on-task during the classroom or individual activity. Dettre (1983) stated that on-task behavior serves as a base for learning and mastering the skills and knowledge. In other words, on-task behavior provides students with opportunities to obtain new knowledge and skills. It is logical that students who stay on-task during the learning process are more likely to perform appropriate behavior rather than inappropriate. In contrast, students who stay off-task are more likely to be engaged in disruptive and inappropriate behavior (Riley, McKevitt, Shriver, & Allen, 2011).

Understanding that appropriate behavior, academic achievement, and on-task behavior are interconnected leads us to seek effective practices that could be employed to influence each of these components. Moore Partin, et al. (2010) suggested two empirically based and teacher-centered methods that can increase appropriate behavior and decrease inappropriate behavior. These are an increased rate of opportunities to respond to academic requests for students and use of teachers' performance feedback. These practices are considered as the best-practice methods (PF; Cavanaugh, 2013).

OTR and Performance Feedback

OTR and PF have been shown as effective methods for improving students' behavioral and academic performance. OTR and PF in the form of verbal praise are strongly interrelated (Sutherland, Wehby, & Yoder, 2002). Increases in rate of OTR gives

teachers more frequent opportunities to praise students. Although both methods have demonstrated significant positive effects on students' achievement, descriptive research has suggested that teachers use these practices infrequently (Gunter & Coutinho, 1997; Sutherland et al., 2002). Carnine (2000) supported this statement and claimed that despite the presence of effective practices (e.g., direct instruction), teachers are more likely to use practices without a strong empirical base. Reinke, Lewis-Palmer, & Merrel (2008) found the same research-to-practice gap regarding classroom management strategies. That is, translating empirically supported practices into real world implementation can be difficult.

There are several descriptive studies that address the topic of discrepancy between research and practice (Browder et al., 2012; Cook, Cook, & Landrum, 2013; Gonsoulin, Zablocki, & Leone, 2012; Maddox & Marvin, 2013). Professional development training should be included in the process of minimizing the gap between research and practice. Additionally, school culture should evolve as a system that supports the development of youth minimizing the use of punitive methods. Cook, Cook, and Landrum (2013) suggested that the current situation and imbalance between theory and practice may be explained by the failure to implement or promote research-based methods to target audiences. That is, researchers are often focused on scientific and methodological aspects and findings of the studies but leave the implementation aspect without proper attention. However, different models and approaches were developed that showed the effective conjunction of theory and practice (e.g., "Tell-Show-Try-Apply" by Browder et al., 2012; "Three-Tiered model" by Gonsoulin et al., 2012). Current researchers' interest in developing the applicability of empirically-based practices gives confidence that such

effective and approved methods as OTR and teacher performance feedback will be implemented with respective fidelity and accuracy. For example, Moore Partin et al., (2010) conducted a descriptive study about using of teacher performance feedback and OTR to promote appropriate student behavior. The goal of that study was to develop a guideline for increasing teachers' effective use of PF and OTR as a preventative measure for reducing problem behavior and increasing appropriate behavior in urban classroom settings. This present research, in fact, is an attempt to investigate theoretical findings of Moore Partin et al. (2010).

Opportunities to Respond

An OTR is a teacher's primary tool for questioning, prompting or cuing the class or an individual student in order to initiate a learning trial. OTR consist of three basic elements: (a) question (e.g., antecedent or an opportunity to respond), (b) answer (e.g., student behavior), and (c) performance feedback (e.g., consequence in a form of praise, correction, move-on; Haydon, Mancil, &Van Loan, 2009). The question, answer, and performance feedback constitute a three term contingency (Cooper et al., 2007) that possess such important features of a teaching strategy as checking for comprehension and adjusting the questions in order to meet the skill level of students (Haydon et al., 2009). Examples of an OTR are when the teacher asks the group or entire class to give a choral response (e.g., "class, who is the President of the USA?", students answered "mister Obama", teacher gives feedback "correct!"), or an individual student to answer a question (e.g., "name of a student, how many syllables in word Ukraine?").

The purpose of an OTR is to increase the likelihood of a desired response, or to increase the number of correct responses and the amount of time students are actively

involved (e.g., on-task behavior) during the learning process (Sutherland, Wehby, & Yoder, 2002). Frequent responses from students enable the teacher to adjust the lesson according to students' performance (Sutherland, Alder, & Gunter, 2003).

Teachers' use of OTR serves as a preventative rather than punitive or reactive methods of managing behavior (Moore Partin et al., 2010). That is, when students are engaged in classroom activities (e.g., being actively involved by the teacher who gives a lot of academic requests) they are less likely to be involved in disruptive behavior. In other words, the teacher keeps students occupied with academic tasks rather than giving them a chance to engage in inappropriate behavior. It is expected that academic achievement will improve problem behavior will decrease while delivering a high rate of effective instructions (e.g., OTR and PF along with it; Sutherland, Wehby, & Yoder, 2002).

Several studies have shown that OTR practice is highly effective when given with a certain appropriate ratio (Moore Partin et al., 2010; Sutherland & Wehby, 2002; Sutherland, Wehby, & Yoder, 2002). The Council for Exceptional Children provided guidelines for teachers of students with disabilities regarding optimal rates of OTR (Sutherland, Alder, & Gunter, 2003). When learning new material, the teacher should provide 4 to 6 OTRs per minute of instruction with 80% accuracy of correct student responses. Following acquisition of new skills, teachers should provide a rate of 8 to 12 OTRs per minute when practicing or during drill work with 90% of accuracy of correct student responses. To summarize, OTR can be defined as the teacher's academic prompt given with purpose of increasing the number of correct student responses-and improving on-task engagement during the class (Haydon, Mancil, & Van Loan, 2009). There are

several researchers that have demonstrated the effectiveness of OTR in the following behavioral and academic areas: (a) increasing the percentage of correct responses and participation and decreasing of off-task behavior (Carnine, 1976); (b) increasing accuracy and fluency in math problem solving (Skinner, Belflore, Mace, Williams-Wlson, & Johns, 1997); (c) increasing of correct responses to teacher initiated academic requests (Sutherland et al., 2002); (d) increasing percent of correct responses, decreasing disruptive behavior and increasing on-task engagement (Sutherland et al., 2003); and (e) decreasing off-task behavior and disruptive behavior (Haydon et al., 2010). Although there is much promise with using OTR to improve academic and behavior outcomes, it must be used in combination with other effective methods like performance feedback.

Performance Feedback

Cavanaugh (2013) defined praise as verbal acknowledgement of expected appropriate social or academic behavior exhibited by students. Numerous studies have suggested the importance of positive feedback in improving of student behavior, in the form of praise, given by teachers (Cavanaugh, 2013; Cooper, Heron, & Heward, 2007; Gunter & Coutinho, 1997; Sutherland et al., 2000). Increasing appropriate behavior, decreasing disruptive behavior, higher level of on-task engagement, and better academic achievements have been suggested to be major benefits of teacher PF (Haydon et al., 2009; Kauffman, & Landrum, 2013; Moore Partin et al., 2010; Sutherland, Wehby, & Copeland , 2000; Sutherland, Wehby, & Yoder, 2002).

There are at least two features of positive PF that might significantly influence its effectiveness: (a) addressing positive PF to specific or non-specific student behavior (Sutherland, Wehby, & Copland, 2000) and (b) appropriate ratio of positive PF

(Sutherland, Wenby, & Yoder, 2002). Sutherland et al. (2000) stated that teacher praise was most effective when it was behavior specific. That is, through the use of positive PF the teacher specifies to the student the behavior being reinforced (e.g., "I am proud of you all for reading quietly!"). An effective praise statement is one that identifies the performed behavior. Despite the fact that the number of praise statements is important, there were no specific ratios found by the researchers (Cavanaugh, 2013; Moore Partin et al, 2010; Sutherland et al., 2000; Sutherland et al., 2002).

Although there were no suggested ratios for PF frequency, some researchers have shown the use of praise on level 1.3 per hour (Van Acker, Grant, & Henry, 1996), and 2.3 per hour (Wehby, Symons, & Shores, 1995), and one per hour per one student (Shores, Jack, Gunter, Ellis, DeBriere, & Wenby, 1993). All researchers agreed that existing levels of praise used by the teachers are exceedingly low. Although there was a need to increase the level of praise, there were no specific ratios recommended. It might be suggested that the optimal ratio of praise depends on teachers' needs (e.g., to maintain the current behavior of a student or to increase desired behavior of a student) but not less than the number of correct or punitive responses.

A higher rate of using praise is preferable and expected from the teacher who wants to improve student academic achievements and appropriate behavior (Gunter, & Coutinho, 1997). In addition to the findings mentioned above, and in order to improve the use of a praise, Moore Partin et al., (2010) developed a five-criteria guideline that permits an evaluation of the effectiveness of teachers' praise: (1) the teacher's praise should be specifically linked to the desired behavior for the class and student(s) that the teacher wishes to increase; (2) the teacher's praise statements should provide informative

feedback on the appropriateness and accuracy of specific behaviors; (3) the teachers' praise statements should give an opportunity for positive interactions between the teacher and student; (4) the teacher should address different student skills when providing praise; and (5) the teacher's praise should be given and distributed among all students in the classroom. Sutherland et al., (2000) stated that OTR may be even more effective when combined with other methods, such as positive performance feedback. It is natural and logical that any student response during the learning process will receive a consequence that will make the student aware of the accuracy of his/her answer (e.g., positive feedback for correct answer, correction for incorrect and other forms of teacher feedback).

Practice implementation and common sense

As described above, OTR and PF are effective and easy-to-use practices that likely result in positive academic and behavioral outcomes. At the same time, those practices have been shown to be used less by teachers in both general and special education settings. Browder et al. (2012) suggested that teachers' lack of time and their heavy workload might explain this situation. However, the need for improved instruction for students with challenging behavior remains topical (Kaufman, & Landrum, 2013). One of the possible answers to this need is brief professional development training with emphasis on ease of use, applicability, effectiveness and common sense. OTR and PF have been described as natural and inherent characteristics of communication. Some researchers have suggested that those characteristics might be manipulated simply by demonstrating to teachers the current ratios that they employ (Sutherland et al., 2000). In this case, OTR and PF are practices that match all important requirements of contemporary practitioners. First, there are researchers that support the effectiveness of

those practices. Second, those practices are shown to be effective in both academic and behavioral improvements of students with challenging behavior. Third, there are researchers that support the use of these practices in combination with each other. Finally, brief professional development training is needed to implement this practice. This means teachers may be able to use OTR and PF with minimal training.

The purpose of the current study is to examine the impact of a brief teacher training and simultaneously manipulated level of opportunity to respond and positive feedback on student's on-task behavior and engaging in classroom activity.

Research Questions

1. Does a brief training related to OTR and PF lead to increases in the practices in general education teachers?
2. If there is an increase in OTR and PF, does it lead to increased students' task engagement?
3. Will the teachers maintain rate of OTR and PF following removal of MotivAider?

Chapter two

Method

Participants

Both teachers and students served in dyads as participants in the current study. Three elementary teachers from urban school with 10 to 20 years of teaching experience took part in the research.

Dyad one consisted of a Caucasian female teacher with 20 years of experience and an African American 4th grade male student. The teacher had 22 students in her classroom and reported minimal previous experience with students with challenging behavior. David was one of the students who attended Positive Approach to Student Success (PASS) program. In addition, the teacher reported, that David was taking medicines (e.g., parents were responsible for him to take it at home). David was described by the teacher as loud and talkative, and someone who could spend an entire day playing on the computer. He was also described as smart and interested in sports. Due to student's academic and behavior performance, he had an Individual Education Plan (IEP).

Dyad two consisted of Caucasian female teacher with 14 years of experience and an African American 5th grade male student. The teacher had 26 students in her classroom and reported minimal previous experience with students with challenging behavior. Andrew also attended PASS program due to his behavioral issues. He had been described by the teacher as a smart, socially active, and willing to help others. At the same time, he was seen as a "5-year old in a 10-year old body" in meaning of his lack of self-control and low ability to take responsibility for his actions. Andrew also had an IEP.

Dyad three consisted of Caucasian female teacher with 10 years of experience and an African American 5th grade male. The teacher had 21 students in her classroom and reported minimal previous experience with students with challenging behavior. Similar with two other subjects Valdemar attended the PASS program and had an IEP due to his academic and behavioral performance. Valdemar was described as an off-task student, who would "talk back", and who blamed everybody around him for his failures. Also he had been described as the class clown.

Settings

There were 22 students in the first class, 26 in the second and, 21 in the third. There were four students with IEPs in the first classroom, including the target student. Seven students with IEPs, including target student were in second class, and four students with IEPs, including the target student, in the third class. All three classrooms provided accommodations within the general education setting. Students sat in rows in the first and third classrooms, and in small groups of four or five students in the second classroom. The first and third students sat with other students in rows while the second student had a separate seat next to the sink at the end of classroom. It is important to note that Andrew needed to turn back in order to be able to see the teacher and information on the board.

Dependent variable

There were two types of dependent variables measured in this study. Child dependent variables included on-task behavior and response given to teacher-directed questions (i.e., opportunities to respond). Teacher dependent variables included: providing opportunities to respond to academic requests (e.g., group questions, individual questions or a question for a target student); and teacher feedback in the form of general

praise, behavior specific praise, move-on, correction, or negative feedback. Each dependent variable will be addressed in the following paragraphs (See Table 1 for summary of variables).

On-task behavior. On-task behavior was defined as engaging in an activity while focusing on the task by looking at and/or approaching (e.g., touching or close approximation) the materials or individuals (e.g. teacher) needed to complete the task (De Haas-Warner, 1991). For instance, the student was (a) looking at a notebook during the task, (b) reaching for the materials needed to complete the assignment (e.g., Crayons, scissors), or (c) was watching the blackboard while the teacher is presenting the material.

Student response. There were three types of student responses to a given OTR: (a) correct responses, (b) incorrect responses, and (c) no response. A correct response was determined when the student responded correctly to the teacher's question without any further prompts (e.g., if the question is, "*Two plus two equals*?", then the answer should be, "*Four*"). An incorrect response was determined when the student failed to correctly answer the teacher's question (e.g., if the question is, "*What is the capital of the USA?*", then the answer might be, "*New York*"). No response was determined when the student failed to give any kind of response (e.g., the student kept silent or ignored the question). Although silence caused by not knowing the answer or wanting to produce it and ignoring the question are different, for the purpose of this study if a student took more than five seconds to respond to teacher question it was coded as a "no response".

Opportunities to respond. For the purpose of this study, an OTR was defined as an interaction between a teacher's academic request and a student's response (Haydon et al.,

2010). Questions, prompting, and cueing were defined as major components within OTR, provided by the teacher to begin a learning trial (Haydon, Mancil, &Van Loan, 2009). Several types of OTR were identified for this study; (a) group question; (b)individual questions; (c) question to a target student .

Group question. Group questions were given by the teacher to all students in the class without specifying a particular student to answer it. For instance, the teacher might ask, "*Class, how many days are in the week?" or, "How many colors are in rainbow?*"

Individual question. Individual questions occurred when the teacher asked a certain student to answer a question. For instance, the teacher named the student and asked the question (e.g., "*Bub, who is the president of the United States of America*?") or the teacher approached the student, gained attention (e.g., eye contact), and asked the question.

Target student question. A question for a target student occurred when the teacher asked the research subject (e.g., dyad student) to answer the question. The teacher asked the question by naming the student or by gaining the student's attention and then asking the question.

Teacher feedback. A logical and naturally occurring consequence to OTR is a student response. A logical and naturally occurring consequence for a student's response is a teacher feedback (e.g., positive in the form of praise or punitive in the form of reprimands). Sutherland, Wehby, and Copeland (2000) stated that the effectiveness of OTR may be increased when it is combined with other methods (e.g., positive feedback in the-form of praise). Therefore, it is important to examine the possible relationship and

influence of different types of feedback in combination with OTR. General and behavior-specific types of praise, move-on, correction, and negative feedback were operationally defined and are presented in Table 1.

General praise. Cavanaugh (2013) defined praise as verbal acknowledgement of expected appropriate social or academic behaviors exhibited by students. General praise was considered when a teacher positively acknowledged a correct answer or appropriate behavior by saying general phrases such as "*Good job!", "Correct!". or "Well done".*

Behavior specific praise. Behavior specific praise was considered when a teacher positively evaluate a group or an individual's correct answer or appropriate behavior by accentuating the target behavior in a phrase. For instance, a teacher may say, "*Good job on keeping quiet! I am proud of you all reading quietly!" or, "Mark, what excellent work on your coloring!*"

Move-on. Move-on feedback was considered when the teacher simply moved to the next topic or task without giving a group or an individual any type of reaction on a previous question. That is the teacher gave the next question or an assignment to students instead of general or individual performance feedback.

Correction. Correction was considered when the teacher amended a group or an individual response by providing the right answer to the question. For instance, if a student failed to correctly complete a math problem (e.g., 3+5), the teacher provided the right answer (e.g., 8). Correction as also considered when the teacher physically helped to put an object in a proper place or by pointing to the correct answer.

Negative feedback. Negative feedback was considered when the teacher reacted to

a group or individual answer by saying something negative. For instance, "*Incorrect," "Fail," "Not right," "Britani, you made a mistake," "Too bad," or "Very poor answer*.

Data collection procedure

Appendix A shows the data sheet used in the study. This data sheet was designed to collect all dependent variables. Momentary Time Sampling (20 seconds) was used to measure on-task behavior. At the end of the 20 second interval, the researcher noted if the student was on-task (+) or off task (0). OTR and PF data were also collected on the data sheet. The 20s interval allowed for simultaneous data collection on the frequency of OTR (e.g., group, individual, and targeted student), student behavior (e.g., correct response, incorrect response, and no response), and teacher feedback (e.g., general praise, behavior specific praise, move on, correction, and negative feedback). The observer made a tally mark in the column corresponding to the type of behavior performed by the teacher and the student. For the convenience of data collectors, both the on-task measurements and frequency counts were combined in one data sheet (Appendix A).

Each session lasted for 10 minutes. After observations, the percentage of student on-task behavior and frequency counts of teacher behaviors were calculated. Baseline and intervention data were collected during 10 minutes of group activities (e.g., calendar math). Six data collection session were conducted daily.

Independent variable

Training for teachers about the importance of OTR rate and appropriate feedback on students' behavior served as an independent variable in this research. During individual 20-minute training, the teachers were provided with the key information about

OTR and feedback to responses and how it might impact student on-task engagement. First, teachers were given a verbal definition of an OTR. For the purpose of this research, an OTR was simply defined as the interaction between a teacher's academic prompt and a student's response (Haydon, Mancil, &Van Loan, 2009). In other words, an OTR was giving a chance to respond on teacher's academic request. In addition, teachers were provided with generic examples and non-examples of OTR given to a group, an individual, or target student. (see Table 1). Teachers were not provided with their own rates of OTR. Second, teachers were given generic information about five possible ways to give feedback to student responses (see Table 1). Third, teachers were not provided with information about forms of feedback they used during baseline. At the final part of the training, teachers were asked to set a target rate of OTR they would like to attain during intervention with help of MotivAider ® (i.e., a device that vibrates as a reminder to engage in the target behavior), and to make sure to provide some positive form of feedback for each correct response. After being given opportunities to ask questions, teachers were thanked for their time and effort and told that observations (i.e., data collection) would continue the next day.

Experimental design

An ABAB withdrawal (reversal) single subject design (Gast & Hammond, 2010) was employed in this study to investigate the relationship between OTR, teacher praise, and student on-task behavior. An ABAB reversal design permits a clear and convincing demonstration of experimental control because of the requirements for the repeated introduction and withdrawal of an intervention. An ABAB single subject research design was considered as the most appropriate among others (e.g., AB, ABA, multiple probe,

multiple baseline, or alternating treatment design) to investigate the research question because it possesses the feature of withdrawing and reintroducing of intervention which allows to demonstrate effectiveness of the intervention.

Baseline data (A1) were collected during small group activities in the classroom. Student on-task engagement and teacher OTR and feedback were collected until clear trend in data points was established. Following the teacher training a second set of data collection sessions (B1) were conducted. The same data on student on-task engagement and teacher OTR and feedback were collected. The data were collected until a clear trend in data points was established.

The third set of data collection (i.e., phase A2 or withdrawal of intervention phase) took place after the B1 phase. During this phase teachers were asked to "teach like they always have in the past." The MotivAider was removed during this phase. This phase examined whether the teachers would use their new skills or revert back to their previous levels of OTR and manner of feedback.

Following a reduction in OTR and feedback, teachers were reminded of the training. This second phase of intervention sought to determine whether or not the second training and re-introduction of the MotivAider improved teachers' OTR and feedback.

Interobserver agreement

Inter-observer agreement (IOA) was assessed for the occurrence or nonoccurrence of the dependent variables. A trained undergraduate student served as the second observer to collect IOA data. Screening data from direct observation were collected prior to

beginning of the intervention. During IOA measures, the secondary observer collected the data at the same time as the primary observer.

IOA estimates for OTR, student behavior, and teacher feedback were calculated using the point-by-point method by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100 (for each of the IOA sessions; Gast, 2010). IOA for the on-task behavior were calculated by comparing agreements of identical data recorded by both observers. Each interval was compared and then the number of agreements were divided by the number of agreements plus disagreements and multiplied by 100.

Chapter three

Results

During the baseline (A1) phase, 38 % of total observations across subjects were co-observed. Average IAO estimates during baseline (A1) phase for on-task behavior were: 86% (range 77% to 93%) for the first student; 72% (range 60% to 83%) for the second student; and 83% (range 71% to 96%) for the third student. Average IOA agreements for OTR during A1 phase were: 84% (range 75% to 96%) for the first teacher; 85% (range 78% to 93%) for the second teacher; and 70% (range 59% to 80%) for third teacher.

During the Intervention (B1) phase, 44% of total observations across subjects were co-observed. Average IAO estimates during B1 phase for on-task behavior were: 73% (range 67% to73%) for the first student; 88% (range 86% to 93%) for the second student; and 84% (range 73% to 93%) for the third student. Average IOA agreements for OTR during B1 phase were: 87% (range 76% to 96%) for the first teacher; 84% (range 73% to 90%) for the second teacher; and 82% (range 76% to 88%) for third teacher.

During the A2 phase, 42 % of total observations across subjects were co-observed. Average IAO estimates during A2 phase for on-task behavior were: 77% (range 76% to 77%) for the first student; 100% (one observation) for the second student; and 83% (range 79% to 87%) for the third student. Average IOA agreements for OTR during A2 phase were: 86% (range 91% to 100%) for the first teacher; 73% (one observation) for the second teacher; and 67% (range 73% to 100%) for third teacher.

During the reintroduction of intervention (B2) phase, 46% of total observations across subjects were co-observed. Average IOA estimates during B2 phase for on-task

behavior were: 91% (range 86% to 96 %) for the first student; 80% (range 79% to 80%) for the second student; and 867% (range 80% to 93%) for third student. Average IOA agreements for OTR during B2 phase were: 85% (range 83% to 86 %) for the first teacher; 100% for the second teacher; and 93% (range 86% to 100%) for third teacher.

Figure 1 presents student on-task behavior, rate of teacher OTR, and performance feedback. Data from *Table 2* presents average and range differences for student on-task behavior. *Table 2* presents data for teacher OTR and performance feedback.

First dyad. Visual interpretation of the first graph of *Figure 1* shows high variability of on-task behavior during baseline phase (range 27% to 93%). Average percentage of on-task behavior during the baseline phase was 67%. Average of teacher OTR per minute during the baseline phase was 0.98 (range 0 to 2.5). Average of teacher positive performance feedback (PF) per minute during the baseline phase was 0.01 (range 0 to 0.4). Average of on-task behavior increased during the first intervention (B1) phase was 74% (range 63% to 90%). Average of teacher OTR and positive PF increased during the B1 phase and were: OTR – 1.19 (range 0.1 to 0.3), and 0.06 (range 0 to 0.3) respectively. Although the level of teacher OTR and PF are close to zero and didn't change dramatically during the intervention phase, there was a seven percent increase in student on-task behavior. During A2 phase average of student on-task engagement decreased and returned to near the level of baseline phase (see Table 2). Teacher OTR and PF also decreased to near the level baseline level (see Table 3). Percentage of on-task engagement and teacher OTR and PF remained highly variable during the A2 phase. There was slight increase of student on-task engagement to 71% during reintroducing of intervention (B2) phase. Teacher OTR decreased significantly B2 phase to lower than

rates of A1 phase (see Table 2). Teacher PF also decreased significantly during B2 phase (see Table 2).

Second dyad. Similar to the first student, visual interpretation of the second graph of Figure 1 shows high variability of on-task behavior during baseline (A1) phase (range 7% to 97%). Average percentage of on-task behavior during A1 phase was 60%. Teacher OTR ranged from 0 to 2.7 per minute with average 0.68 per minute. Average teacher PF per minute during the A1 was 0.14 (range 0 to 0.6). Following training and use of MotivAider on-task behavior increased significantly during B1 phase and was 81% (range 77% to 93%). Teacher OTR actually decreased during B1 phase to an average of 0.49 per minute (range 0 to 0.3). PF nearly doubled during B1 phase to a mean of 0.26 per minute (range 0.1 to 0.8). Average of on-task engagement remained nearly the same during A2 phase while teacher OTR and PF decreased to level lower than initial baseline). There was an increase in student on-task behavior during B2 phase to an average of 85% (range 70% to 93%). Teacher OTR and PF dropped to zero level during the B2 phase, even though the MotivAider was being used.

Third dyad. Visual interpretation of the final graph of Figure 1 shows high variability of on-task behavior during baseline phase with a mean of 65% (range 40% to 97%). Teacher OTR per minute during the baseline phase averaged 1 (range 0 to 2). PF per minute during the baseline phase was 0.08 (range 0 to 0.1). During first intervention phase (B1), average on-task behavior increased 24% to a mean of 85% (range 57% to 93%). Average of teacher OTR and positive performance feedback also increased during B1 phase to 1.22 (range 0.4 to 2.7), and 0.7 (range 0.1 to 2.3). Student on-task engagement dropped 34% during A2 phase. Teacher OTR and PF decreased slightly

during A2 phase (see Table 3). Student on-task engagement increased 32% during B2 phase while teacher OTR and PF decreased (see Table 2).

Chapter four

Discussion

This study sought to investigate whether the brief teacher training combined with the use of a MotivAider would impact teacher rates of OTR and PF and if increases in those would impact students' on-task behavior during classroom activity. The first research question sought to determine if a brief training related to OTR and PF would lead to increases in these practices in general education teachers. OTR rates increased for the first and third teachers increased and decreased for a second teacher after first implementation of intervention (see Table 3). Rates of PF increased for all three teachers during the first intervention phase. It was expected that teachers would increase their OTR and PF during reintroducing of the intervention. But, in contrast with expectations, all three teachers decreased their OTR and PF during A2 and B2 phases.

It is important to note that initial levels of OTR and PF rates of all three teachers were near zero (see Table 3) and did not change significantly after implementation of intervention. In order to avoid professional and personal frustration, teachers were not provided with information about their current levels of OTR and PF following any phase of the study. In addition, because teacher's OTR and PF rates were well below suggested rates (i.e., 4-6 per minute during learning of new material, and 8-12 per minute while reviewing previous material) their own goal established after training was one OTR per 75 sec. However, none of them were able to reach or maintain their goal rate of OTR. Several reasons may explain low teacher results in improving their OTR and PF. First, personal beliefs in validity of strategy may have impacted performance. For example, teachers may not have believed that increased OTR and PF would increase student on-

task engagement. Second, there was a resistance to follow directions of the proposed intervention. Teachers are used to giving directions and instructions to students. These teachers seemed to have some resistance when professionals out of their school or area were trying to instruct them. Third, misunderstanding in use of MotivAider. The first teacher simply did not perceive the MotivAider signal as a direct trigger to perform the OTR. Finally, a lack of time appeared to hinder results. There was not enough time for teachers to change their routine behavior. That is, the phases of intervention and withdrawal lasted four to six days each. In addition, there were some gaps in data collections between observations (i.e., spring break, absence of a teacher or student).

The second research question focused on determining whether increases in teacher OTR and PF would lead to increase in students' on-task behavior. Baseline data showed high variability of on-task behavior of all three students (see Figure 1). Despite high variability of data, the average percentage of on-task behavior of all three students during the baseline was lower than it was expected (see Table 2). Dyad I increased his level of on-task engagement during B1 phase. Although his on-task behavior fell in A2 phase and increased in B2 phase, his overall behavior was stable and remained it during A2, and B2 phases. In contrast to student increase of on-task engagement, teacher OTR and PF decreased during A2 and B2 phases. Anecdotally, Dyad I teacher demonstrated the highest resistance and lowest level of cooperation during study. However, even slight increase in OTR level during B2 phase lead to slight increasing and remaining of higher on-task level of student. During A2 phase, the second student remained the same with B1 phase level of on-task engagement, while teacher OTR and PF were decreasing. Finally, continuous decreasing in OTR and PF of second teacher lead to significant decrease in

student on-task engagement. OTR and PF rates of third teacher decreased as well as student on-task engagement during A2 phase. However, in contrast to teacher decreases in OTR and PF, student on-task engagement increased during B2 phase.

General differences in students' on-task engagement that were observed during the baseline, intervention, withdrawal, and reintroducing of intervention phases may be explained by several factors. First, differences in management of student behavior and expectations (e.g., first student was medicated during research period and teacher reported that parents were inconsistent regarding this duty) appeared to effect results. Second, other school related interventions (e.g., first and second students were actively involved in behavior support program and spend a lot of time with behavior support coaches while third student did not attend the behavior support room during the study) interfered with the students' time of engagement in the classroom activities. Finally, there were other influences (e.g., the study took place during period of spring break and close to the end of school year when teachers reported fatigue, higher level of students' irritation and generic higher level of off-task behavior) that were out of the control of the researcher that effected outcomes.

The third research question sought to examine if teacher's ability to maintain rate of OTR and PF after following removal of MotivAider. All three teachers didn't significantly increase their level of OTR and PF. It is logical, that they did not maintain higher level of OTR and PF because they did not reach target levels. Unfortunately, the brief training and MotivAider did not improve usage of OTR of the teachers that participated in study. An anecdotal finding was that all three teachers demonstrated higher levels of using general praise statements (e.g., "good job on following my

directions") during the classes after implementing of the intervention. However, those statements were not related to OTR and were not included in results of the study. It is likely that teacher awareness of being watched lead to somewhat higher using of general positive verbal statements. It was also found, that instead of positive PF, the most frequent teacher feedback was "move-on".

Limitations and future suggestions

Several limitations were identified in this present study. First, there was unstable baseline data for all three students. The initial length of baseline phase was extended in order to achieve stable data; however, the instability was consistent and appeared as a strong characteristic of all subjects and extra observations did not result in baseline stability (see Figure 1). A second limitation addresses the data collection process. That is, there were examples of postponing or delaying with the observations because of students challenging behavior. For example there were several sessions cancelled because student was in a behavior resource room for behavioral redirection. Suggested observation times changed due to teacher's needs and included individual activities which were not appropriate for collection of OTR and PF data. Another limitation related to data collection procedure was variety of data to collect simultaneously and clarity of its definition. That is, there were situations when it was difficult to code certain types of OTR or PF. There were sessions when students played a Jeopardy game where answers to questions were given with a pre-determined latency which did not match the data sheet. A third limitation is low IOA agreement on a first student (72%) during baseline and on third teacher OTR (70%) during B1 phase. Partially this limitation might be explained by the complexity of a data collection procedure (e.g., simultaneous collection of several

types of data). A forth limitation was the research timeline. That is the time limitation led to somewhat premature beginning of intervention and withdrawal phases of the study. A final limitation of this study was low effectiveness of proposed intervention. Unfortunately, results didn't show significant changes in student on-task engagement related to changes in teacher OTR and PF. This could be due to the low increases in teacher behavior. Future studies are needed to support or to decline the idea of relationship between student on-task engagement and simultaneously manipulated ratios of teacher OTR and PF.

Several suggestions for future researchers may be obtained from the experience of this present study. First, is to obtain a clear definition of all possible behaviors and ways to code it. It is also recommended to test the designed data collection sheet prior the actual data collection and to discuss all possible misunderstandings. Second, if possible, is to find the way to avoid collecting of different types of data simultaneously. It is likely that doing this may result in higher IOA rate and in improving of quality of the data. Third, in order to avoid delays in research it is important to be up to date with all changes in plans and school schedule (e.g., field trips, weather related changes in school plans, sickness of students). Fourth, for better understanding of student needs in high level of involvement in classroom activity, it is preferable to include the topic of OTR, PF and its relationship with students' on-task engagement in teachers' professional development training. Fifth, to use different strategies of dealing with teachers' resistance during research. That is, using strategy like Tell-Show-Try-Apply (Browder et al., 2012) was shown as an effective model for making positive relations and gaining collaborative results. However, some issues related with tenured teachers who struggle with

challenging behaviors are likely to appear during cooperation or research (e.g. it is expected that tenured teachers are more likely to be inconsistent during research cooperation). In this case, the best way to solve this situation is an attempt to build good and trustworthy relationship between researchers and teachers. Based on results of this current study, future researches may address following research questions: (a) comparison of impact of the MotivAider on tenured and untenured teachers; (b) comparison of impact of an alternative intervention on student on-task behavior, and (c) imbedding in research plan a specific time devoted to building of strong and trustworthy relationship with participants.

Table 1. Operational definitions and dependent measures

Behavior	Definition	Example
Student behavior		
On-task behavior	The student is engaged in an activity while focusing on the task by looking at and/or approaching the materials or individuals (e.g. teacher) needed to complete the task	*Looking at object; eye contact with teacher; touching an object or close approximation*
Response behavior		
Correct response	The student responds correctly to teachers' question without any prompts	*Teacher: "Two multiple three equals?"* *Student: "Six"*
Incorrect response	The student failed to answer correctly to teachers' question	*Teacher: "the color of snow is…?"* *Student: "Blue"*
No response	The student failed to give any kind of respond (e.g., the student kept silence, or ignored the question)	
Teacher behavior		
Opportunity to respond	An interaction between a teacher's academic request and a student's response	
Group question	A question given by teacher to all class without specifying of any particular individual to answer it	*Class, how many days are in the week? How many colors are in rainbow?*

Table 1 (Continued)

Behavior	Definition	Example
Individual question	Teacher ask a certain student to answer the question	*Bub, who is the president of the United States of America*?
Target student question	The teacher asked the target student) to answer the question	*(Name of Target student) what is opposite to left?*
Teacher feedback		
General praise	General positive verbal acknowledgement of expected appropriate social or academic behavior exhibited by student	*Good job! Correct! Well done!*
Behavior specific praise	Specific to behavior positive verbal acknowledgement of appropriate social or academic behavior exhibited by student	*Good job on keeping silence! I am proud of you all reading quietly!*
Move-on	Moving to the next topic or task without giving a group or an individual any type of reaction on previous question or assignment	
Correction	A group or an individual respond in a form of giving a right answer to the question	*Student responded that 2+2 equals 5, the teacher correct it to four*
Negative feedback	Reaction on a group or an individual answer in a form of giving a negative saying of any kind	*Incorrect; Fail; Too bad; Very poor answer*

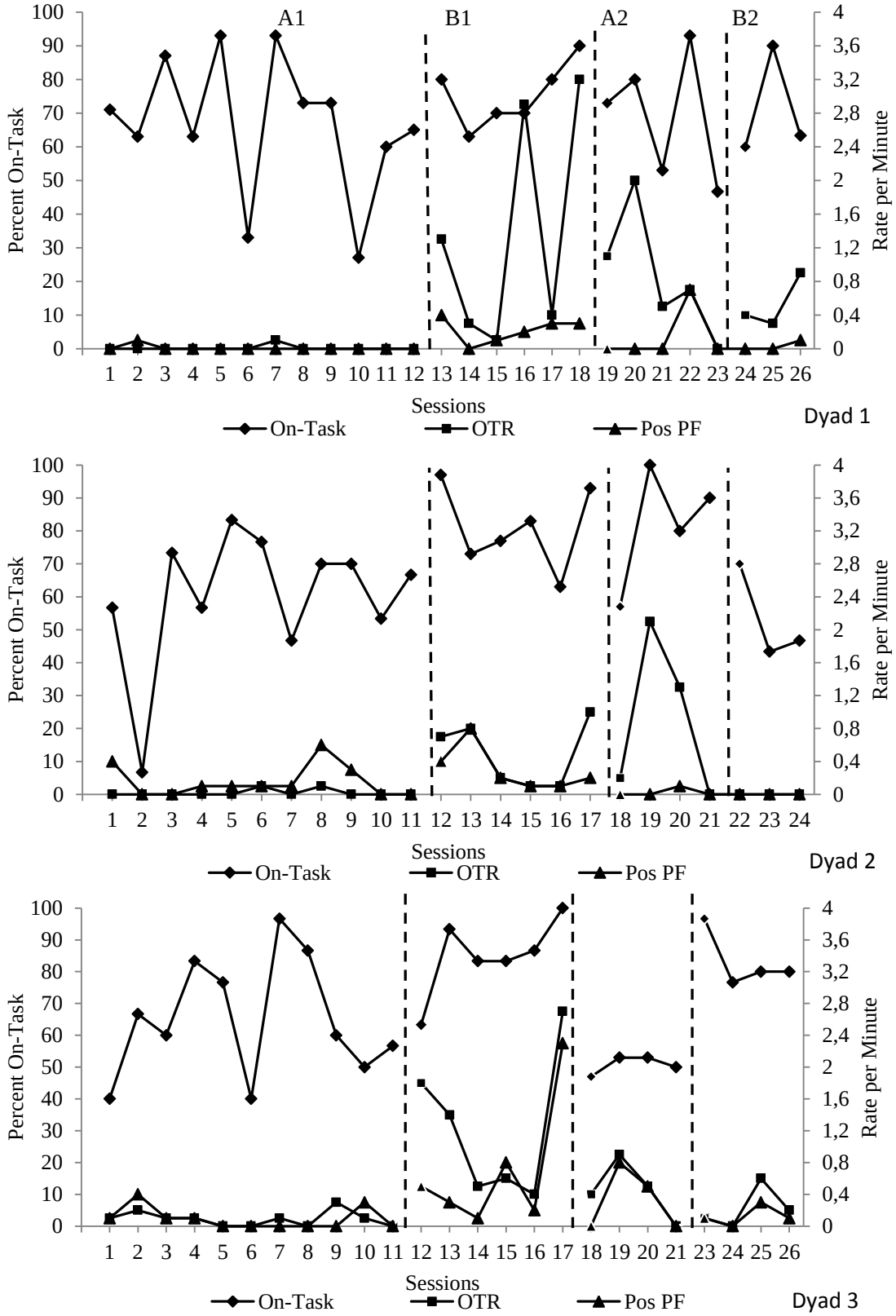
Table 2. Average student on-task behavior by phase

	A1	B1	A2	B2
Student 1	67	74	69	71
Student 2	60	80	82	53
Student 3	65	85	51	83

Table 3. Average teacher opportunities to respond and performance feedback by phase

	OTR				PF			
	A1	B1	A2	B2	A1	B1	A2	B2
Teacher 1	0.98	1.19	0.86	0.53	0.01	0.19	0.14	0.03
Teacher 2	0.68	0.49	0.90	0.0	0.14	0.26	0.03	0.0
Teacher 3	1.00	1.22	0.95	0.23	0.08	0.70	0.28	0.10

Figure 1. Percentage of student on-task behavior and rate of teacher OTR and PF



Appendices

Appendix A. Data Collection Sheet*

Date: _____Time: _____to_____ Class: 1 2 3 Student: 1 2 3 IOA: Y N Obs #: ____												
Interval		Antecedent			Behavior			Feedback				
1		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
2		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
3		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
4		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
5		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
6		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
7		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
8		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
9		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
10		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
11		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
12		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
13		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
14		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
15		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
		G	I	T	C	I	NR	GP	BSP	MO	COR	NEG
∑ =												

*Note: Intervals 16-30 were on the reverse side of the form and were formatted identical to these intervals.

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